



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/798,855

03/12/2004

Hisashi Amaya

12054-0024

6672

22902

7590

03/05/2008

CLARK & BRODY

1090 VERMONT AVENUE, NW

SUITE 250

WASHINGTON, DC 20005

EXAMINER

ROE, JESSEE RANDALL

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

03/05/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/798,855	Applicant(s) AMAYA ET AL.	
	Examiner Jessee Roe	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 13-20 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 13-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1-8 and 13-20 are pending wherein claims 9-12 are canceled.

Status of Previous Rejections

The previous rejections of claims 1-8 under 35 U.S.C. 103(a) as being unpatentable over Hoshino et al. (US 4,878,955) is withdrawn in view of the Applicant's arguments. The previous rejection of claims 13-20 under 35 U.S.C. 103(a) as being unpatentable over Hoshino et al. (US 4,878,955) in view of Kushida et al. (US 6,379,621) is withdrawn in view of the Applicant's arguments.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 and 13-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-8 and 13-20 recites the limitation "the prior austenite" in claims 1-8 and 13-20. There is insufficient antecedent basis for this limitation in the claims.

Examiner Interpretation

With respect to the recitation "the amount of carbides in grain boundaries of the prior austenite is not more than 0.5 volume %." of claims 1-8 and 13-20, the Examiner notes that this recitation would be a characteristic of the initial or intermediate product that would not further limit the structure of the final product. With respect to the recitation "the amounts of Cu and Mo effective to form a sulfide layer on a formed chromium oxide layer, the sulfide layer formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment", the Examiner notes that this recitation would not require a sulfide layer or a chromium oxide and the martensitic stainless steel would only be capable of forming a sulfide layer and a chromium oxide layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schumacher (US 5,089,067).

In regards to claims 1-8, Schumacher ('067) discloses a martensitic stainless steel alloy that would have utility in the production of golf clubs, forged golf clubs, cutlery, boat propellers and other cast, forged and wrought products, including free machining

Art Unit: 1793

materials having a composition comparable to that of the instant invention as shown in the table below (abstract).

Element	From Instant Claims (mass percent)	Schumacher ('067) (weight/mass percent)	Overlapping range
C	0.01 – 0.10	0 – about 0.08	0.01 – about 0.08
Si	0.05 – 1.0	0 – about 1	0.05 – about 1
Mn	0.05 – 0.95	about 1 – about 4	about 1
P	0 – 0.03	0 – about 0.03	0 – about 0.03
S	0 – 0.01	0 – about 0.5	0 – 0.01
Cr	9 – 15	about 13 – about 17	about 13 – 15
Ni	0.1 – 4.5	0 – less than 1	0.1 – less than 1
Al	0 – 0.05	0	0
N	0 – 0.1	0 – about 0.12	0 – 0.1
Cu	0.05 – 5	about 1.5 – about 4	about 1.5 – about 4
Fe	balance	balance	balance

The Examiner notes that the disclosed amounts of carbon, silicon, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, and copper of the martensitic stainless steel alloy disclosed by Schumacher ('067) overlaps the composition of the claimed invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed composition from the composition disclosed by Schumacher ('067) because Schumacher ('067) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the range of manganese of claims 1-8 and 13-20, the Examiner notes that 0.95 mass percent manganese would be close enough to about 1 mass percent manganese such that one of ordinary skill would expect the same properties. MPEP 2144.05 I.

With respect to the recitation “with plastically-processed history” of claims 1-8

and 13-20, the Examiner notes that the claims are directed to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. MPEP 2113.

With respect to the claimed hardness range of 30 – 45 HRC of claims 1-8 and 13-20, Schumacher ('067) discloses that the hardness of the alloy would be in the range of Rockwell B 95 (HRB 95) – Rockwell C 40 or higher (HRC 40+) which would read on the hardness range of the instant invention (col. 4, lines 56-68).

With respect to the recitation "the amount of carbides in grain boundaries of the prior austenite is not more than 0.5 volume %." of claims 1-8 and 13-20, the Examiner notes that this recitation would be a characteristic of the initial or intermediate product that would not further limit the structure of the final product. In order to establish that the claimed intermediate is a contributing cause of the unexpectedly superior activity or property of an end product, an applicant must identify the cause of the unexpectedly superior activity or property (compared to the prior art) in the end product and establish a nexus for that cause between the intermediate and the end product. MPEP 716.02(b)(III).

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ of claims 1, 3, 5 and 7, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the

Art Unit: 1793

contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Schumacher ('067) such that the formula would be satisfied because Schumacher ('067) discloses the same utility throughout the disclosed ranges.

With respect to the formula $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ of claims 2, 4, 6 and 8, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Taklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Schumacher ('067) such that the formula would be satisfied because Schumacher ('067) discloses the same utility throughout the disclosed ranges.

Still regarding claims 3-4 and 7-8, Schumacher ('067) discloses up to 0.5 weight percent niobium, vanadium, titanium, and/or zirconium, which reads on "at least one of the elements of Ti: 0.005 - 0.5%, V: 0.005 - 0.5% and Nb: 0.005 - 0.5%" of the instant invention (abstract).

Still regarding claims 5-6 and 7-8, Schumacher ('067) discloses up to about

Art Unit: 1793

0.005 weight percent boron, which reads on “one more elements of B: 0.0002-0.005%, Ca: 0.0003 – 0.005%, Mg: 0.0003 - 0.005% and rare earth elements: 0.0003 – 0.005%” of the instant invention (abstract).

With respect to the recitation wherein “the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400°C or lower tempering treatment, or air cooling followed by a 400°C or lower tempering treatment” of claims 13-20, the Examiner notes that the claims are directed to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. MPEP 2113.

With respect to the recitation “the amounts of Cu and Mo effective to form a sulfide layer on a formed chromium oxide layer” of claims 13-20, the Examiner notes that Schumacher ('067) discloses an overlapping composition. Therefore, it would be expected that Schumacher would have the effective amounts of copper and molybdenum to form sulfide layer on a formed chromium oxide layer. MPEP 2112.01 I.

Claims 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schumacher (US 5,089,067) alone, or alternatively with evidence from Yamane et al. (JP 09-041093).

In regards to claims 13-20, Schumacher ('067) discloses a martensitic stainless steel alloy the would have utility in the production of golf clubs, forged golf clubs, cutlery, boat propellers and other cast, forged and wrought products, including free machining

Art Unit: 1793

materials having a composition comparable to that of the instant invention as shown in the table below (abstract).

Element	From Instant Claims (mass percent)	Schumacher ('067) (weight/mass percent)	Overlapping range
C	0.01 – 0.10	0 – about 0.08	0.01 – about 0.08
Si	0.05 – 1.0	0 – about 1	0.05 – about 1
Mn	0.05 – 0.95	about 1 – about 4	about 1
P	0 – 0.03	0 – about 0.03	0 – about 0.03
S	0 – 0.01	0 – about 0.5	0 – 0.01
Cr	9 – 15	about 13 – about 17	about 13 – 15
Ni	0.1 – 4.5	0 – less than 1	0.1 – less than 1
Al	0 – 0.05	0	0
N	0 – 0.1	0 – about 0.12	0 – 0.1
Cu	0.05 – 5	about 1.5 – about 4	about 1.5 – about 4
Mo	0.05 – 5	0 – about 1	0.05 – about 1
Fe	balance	balance	balance

The Examiner notes that the disclosed amounts of carbon, silicon, phosphorus, sulfur, chromium, nickel, aluminum, nitrogen, copper and molybdenum of the martensitic stainless steel alloy disclosed by Schumacher ('067) overlaps the composition of the claimed invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed composition from the composition disclosed by Schumacher ('067) because Schumacher ('067) discloses the same utility (martensitic stainless steel alloy) throughout the disclosed ranges.

With respect to the range of manganese of claims 13-20, the Examiner notes that 0.95 mass percent manganese would be close enough to about 1 mass percent manganese such that one of ordinary skill would expect the same properties. MPEP 2144.05 I.

With respect to the recitation “with plastically-processed history” of claims and

13-20, the Examiner notes that the claims are directed to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. MPEP 2113.

With respect to the claimed hardness range of 30 – 45 HRC of claims 13-20, Schumacher ('067) discloses that the hardness of the alloy would be in the range of Rockwell B 95 (HRB 95) – Rockwell C 40 or higher (HRC 40+) which would read on the hardness range of the instant invention (col. 4, lines 56-68).

With respect to the recitation "the amount of carbides in grain boundaries of the prior austenite is not more than 0.5 volume %." of claims 13-20, the Examiner notes that this recitation would be a characteristic of the initial or intermediate product that would not further limit the structure of the final product. In order to establish that the claimed intermediate is a contributing cause of the unexpectedly superior activity or property of an end product, an applicant must identify the cause of the unexpectedly superior activity or property (compared to the prior art) in the end product and establish a nexus for that cause between the intermediate and the end product. MPEP 716.02(b)(III).

With respect to the formula $0.2 \leq \text{Mo} + \text{Cu}/4 \leq 5$ of claims 13, 15, 17 and 19, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more

than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Schumacher ('067) such that the formula would be satisfied because Schumacher ('067) discloses the same utility throughout the disclosed ranges.

With respect to the formula $0.55 \leq \text{Mo} + \text{Cu}/4 \leq 5$ of claims 14, 16, 18 and 20, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, In re Cooper and Foley 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, Taklatwalla v. Marburg, 620 O.G. 685, 1949 C.D. 77, and In re Pilling, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those of ordinary skill in the art. In re Austin, et al., 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to select the desired amounts of copper and molybdenum from the ranges disclosed by Schumacher ('067) such that the formula would be satisfied because Schumacher ('067) discloses the same utility throughout the disclosed ranges.

Still regarding claims 15-16 and 19-20, Schumacher ('067) discloses up to 0.5 weight percent niobium, vanadium, titanium, and/or zirconium, which reads on "at least one of the elements of Ti: 0.005 - 0.5%, V: 0.005 - 0.5% and Nb: 0.005 - 0.5%" of the instant invention (abstract).

Still regarding claims 17-18 and 19-20, Schumacher ('067) discloses up to about 0.005 weight percent boron, which reads on "one more elements of B: 0.0002-0.005%,

Ca: 0.0003 – 0.005%, Mg: 0.0003 - 0.005% and rare earth elements: 0.0003 – 0.005%” of the instant invention (abstract).

With respect to the recitation wherein “the martensitic stainless steel having a structure resulting from one of quenching, air cooling, quenching followed by a 400°C or lower tempering treatment, or air cooling followed by a 400°C or lower tempering treatment” of claims 13-20, the Examiner notes that the claims are directed to a product and not a process. Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. MPEP 2113.

With respect to the recitation “the amounts of Cu and Mo effective to form a sulfide layer on a formed chromium oxide layer” of claims 13-20, the Examiner notes that Schumacher ('067) discloses an overlapping composition. Therefore, it would be expected that Schumacher would have the effective amounts of copper and molybdenum to form sulfide layer on a formed chromium oxide layer. MPEP 2112.01 I.

With respect to the recitation “the sulfide layer formed as a result of the martensitic stainless steel being subjected to a sulfur-containing environment” of claims 13-20, the Examiner notes that the claims would not require a sulfide layer or a chromium oxide layer, but only an effective amount of copper and molybdenum to form a sulfide layer on a formed chromium oxide layer. Alternatively, Schumacher ('067) does not specify that the martensitic stainless steel would form a sulfide layer.

Yamane (JP '093) disclose a martensitic stainless steel having a substantially similar composition wherein the molybdenum would prevent stress corrosion cracking

and copper would strengthen and assist the molybdenum film to control the hydrogen (from the hydrogen sulfide) diffusion into the steel by forming a copper sulfide layer [0013].

Therefore, it would be expected that the martensitic stainless steel, as disclosed by Schumacher ('067), would be capable of forming a copper sulfide layer in a sulfur-containing environment, as disclosed by Yamane (JP '093) because Yamane (JP '093) disclose a martensitic stainless steel composition substantially similar to that of Schumacher ('067) [0013] forming a sulfide layer when exposed to a sulfur-containing environment .

Response to Arguments

Applicant's arguments with respect to claim 1-8 and 13-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1793

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

JR